

APPLICANTS: J. Greer *et al.*
U.S.S.N.: 10/670,765

Amendments to the Drawings

The attached sheets of drawings include “formal drawings.” In these Figures, the coloring/shading is removed and the clarity of the lines is improved to provide clearer illustrations. No new matter is added. These sheets replace the original Figures.

Attachment: Replacement Sheets

REMARKS

Amendments to the Claims

Upon entry of the present amendments, claims 1-6 and 8 are pending. Claim 7 is cancelled without any intention to abandon any of its subject matter, but with the intention that a claim of the same, lesser, or greater scope may be pursued in a later application.

Claim 8 is amended to correct a self-evident typographical error; the substance of the claim is not altered. Accordingly, the present amendment does not introduce new matter.

Each of the grounds for rejection cited in the Office Action is addressed, below, under an appropriate sub-heading.

35 U.S.C. §112, First Paragraph

Claims 7 and 8 were rejected under 35 U.S.C. §112 as being non-enabled by the disclosure. Specifically, the United States Patent and Trademark Office suggested that the motors are not enabled by the disclosure. Claim 7 has been canceled, thereby leaving only claim 8 rejected under §112.

The use of a rotary motor to rotate the target platform as well as the use of motors for x/y displacement of the table are disclosed at page 5, lines 23-25 of the patent application, and the associated mechanical structure is described, *e.g.*, at page 4, lines 16-22. Furthermore, embodiments of the motors (*i.e.*, the cylindrical structures in the drawings) are readily identifiable in FIGS. 4 and 6 of the patent application. As shown in FIG. 6, the bottom motor clearly is configured to displace the structure 28 along the z axis via rails 32, while the left-most motor clearly is configured to displace the structure 28 along the x-axis via rails 34. Finally, the two top-most motors are clearly configured to rotate the target platforms 22 about the y axis via rotatable stage 26 and associated gears. The use of conventional rotary and linear motors to generate rotary and linear displacement of a structure is well known in the art.

Clearer “formal” drawings are filed herewith. These replacement drawings may enable easier identification of the motors in the figures and may make it easier to see how they are configured in relation to the remainder of the apparatus in this example. Though, no new matter is added in these replacement drawings.

Because the text and drawings accordingly enable the inclusion of a motor in the apparatus, as described in claim 8, Applicants respectfully request that this ground for rejection against claim 8 be reconsidered and withdrawn.

35 U.S.C. §103

A) Claims 1-5:

Claims 1-5 were rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. 5,672,210 (Moto *et al.*) in view of US Pat. 6,024,851 (Radhakrishnan).

Claim 1 is in independent form, and claims 2-5 depend therefrom and, therefore, incorporate its limitations. Claim 1 is directed to a method, wherein the following steps are carried out in repeating, alternating sequence: (d) a pulsed laser beam is scanned across a target with the rotational position of the target fixed and (e) the target is rotated by an incremental angle. This alternating sequence of steps enables the production of laser scan patterns such as those illustrated in FIGS. 7-9 of the present application; these laser scan patterns, in turn, can provide for substantially uniform erosion of the target surface, as described in the Summary of the present application.

Moto *et al.* fails to teach or suggest directing the laser across the target and then rotating the target by an incremental angle and repeating those steps *in alternating sequence*. Instead, Moto *et al.* merely teaches that “[t]he target holder 13 may be capable of rotating around an axis perpendicular to the exposed target surface”; Moto *et al.* fails to provide any teaching or suggestion of halting the rotation while the laser is scanning the target surface, as specified by claim 1.

As specified in the Office Action, Radhakrishnan likewise “teaches a system for pulsed laser deposition of thin films, *while* being exposed to the pulsed laser beam” (emphasis added).

The target is positioned in a conventional target holder, that is rotated at a speed of approximately 1000 RPM during deposition. . . . The target is rotated by a target holder, while being exposed to the pulsed laser beam.

Id., Col. 5, lines 34-51. Accordingly, the rotation of the target and the scanning of the laser beam across the target are carried out *simultaneously* in Radhakrishnan rather than in *alternating*

sequence, wherein the rotational position of the target is fixed during laser scanning, as specified in Applicants' claim 1.

Because these limitations from claim 1 are not disclosed or suggested in Moto *et al.* or in Radhakrishnan, Applicants respectfully request that this ground for rejection be reconsidered and withdrawn.

B) Claim 6:

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Moto *et al.* in view of Radhakrishnan, as asserted with respect to claims 1-5, and further in view of US Pub 2004.0033702 A1 (Tamanyan *et al.*)

Claim 6 depends from claim 1 and, therefore, incorporates its limitations. Consequently, claim 6 can be differentiated from Moto *et al.* and from Radhakrishnan for the reasons cited with respect to claims 1-5, above.

Tamanyan *et al.* also discloses rotating the target; however, it fails to provide any disclosure or suggestion of making the rotation periodic and incremental as well as sequentially alternating those incremental rotations with laser scan patterns. Consequently, Tamanyan does not remedy the deficiencies of Moto *et al.* and Radhakrishnan; and applicants, accordingly, respectfully request that this ground for rejection be reconsidered and withdrawn.

C) Claims 7 and 8:

Claims 7 and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Moto *et al.* in view of Radhakrishnan, and further in view of Tamanyan *et al.*

As noted above, claim 7 has been canceled, thereby leaving claim 8 as the sole apparatus claim. Claim 8 recites, *inter alia*, software code that generates commands for (a) rotating the platform by an angular increment and stopping the rotation, and (b) executing the x/y laser scan pattern while the rotation of the platform is stopped.

The United States Patent and Trademark Office asserted that the claim is obvious, because “[t]he provision of mechanical or automated means to replace manual activity was held to be obvious.” As indicated, above, with respect to the method claims, however, the software here is not simply provided to automate known manual activity. To the contrary, the process of

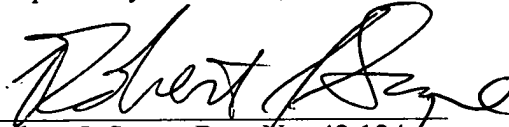
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incrementally rotating the platform, stopping the rotation and then executing the x/y scan pattern is, itself, novel and non-obviousness. Consequently, an apparatus including software code for automating this novel and non-obvious process is likewise non-obvious.

CONCLUSION

On the basis of the foregoing amendments, Applicants respectfully submit that the pending claims are in condition for allowance. If there are any questions regarding these amendments and remarks, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

Respectfully submitted,



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